



Fire Protection Training

Procedures Handbook 4300

POWER TOOLS

TOPIC: Components and Safety Considerations for Portable Lighting Equipment

TIME FRAME: 1:00

LEVEL of INSTRUCTION: Level I

BEHAVIORAL OBJECTIVE:

Condition: A written quiz

Behavior: The firefighter will be able to identify the major components of portable lighting equipment and list appropriate safety considerations.

Standard: With a minimum of 80% accuracy

MATERIALS NEEDED:

- Pens
- Audio visuals
- Chalkboard/chalk
- White Board/erasable pens
- Power generator
- Portable light
- Extension cord
- Pig-tail
- Junction box
- Hand lantern
- Appropriate audio visual equipment

REFERENCES: IFSTA, Essential of Fire Fighting, 5th Edition: Chapter 8-11-1



Fire Protection Training

Procedures Handbook 4300

POWER TOOLS

PREPARATION:

Firefighters are often called upon to perform emergency operations in the worst possible environment. One environmental element that can be controlled to a certain degree is darkness. Through the use of portable lighting equipment one can safely provide "working" light for fire fighting, rescue, etc. In order to exercise this element of environmental control, the firefighter must have a knowledge of the components and types of portable lighting equipment available.



Fire Protection Training

Procedures Handbook 4300

COMPONENTS AND SAFETY CONSIDERATIONS FOR PORTABLE LIGHTING EQUIPMENT

PRESENTATION	APPLICATION
<p>I. LIGHTING SYSTEMS</p> <p>A. Portable Lighting Is Used as a "System"</p> <ol style="list-style-type: none">1. The firefighter brings together various pieces of equipment and combines them to form a system2. The firefighter must recognize the relationship of one component to another <p>II. PORTABLE LIGHTING COMPONENTS</p> <p>A. Power Source</p> <ol style="list-style-type: none">1. Fire service generators<ol style="list-style-type: none">a. Utilized to provide electrical power at emergency scenesb. Large generator may be mounted on a trailer and towed by vehiclec. Smaller generator is stored on apparatus, often in compartmentsd. Rating of generator determines number of appliances that can be operated2. Domestic power<ol style="list-style-type: none">a. Power pre-wired into structuresb. 110v a/c ordinary house outlets	<p>Typical Lighting System</p> <p>Example:</p> <p>Generator Extension cords Junction box Portable lights</p> <p>How can fire department equipment be integrated with residential domestic power?</p>

4311.1



Fire Protection Training

Procedures Handbook 4300

COMPONENTS AND SAFETY
CONSIDERATIONS FOR PORTABLE
LIGHTING EQUIPMENT

PRESENTATION	APPLICATION
<ul style="list-style-type: none">c. Most fire department lighting equipment can be operated with domestic power if it is groundedB. Extension Cords<ul style="list-style-type: none">1. Precut, 3-strand industrial grade wire (#12-10)2. Utilized to route electrical power from the source to the site where needed3. Plugs must be compatible with all appliances4. Connections should be water proof5. Extension cords may be carried in a variety of ways:<ul style="list-style-type: none">a. Reel mounted<ul style="list-style-type: none">(1) Fixed on apparatus or portable(2) 50' - 300' in lengthb. Coiled or nested<ul style="list-style-type: none">(1) Carried in compartments(2) Generally 10' - 100' in length(3) Require uncoiling or stretching for deployment(4)c. Pig-tails<ul style="list-style-type: none">(1) "Short" extension cords(2) 1' - 5' in length(3) Often carried in a box or fastened to appliances	<p>What are the different configurations of extension cords that may be carried on an apparatus?</p> <p>What are pigtails?</p>

4311.1



Fire Protection Training

Procedures Handbook 4300

COMPONENTS AND SAFETY
CONSIDERATIONS FOR PORTABLE
LIGHTING EQUIPMENT

PRESENTATION	APPLICATION
<p>(4) Used for short span connections or to connect components of the system together which may have incompatible plugs</p> <p>C. Junction Boxes</p> <ol style="list-style-type: none">1. Used to divert power from main extension cord to separate circuits2. Similar in function to a wye for fire hose3. Usually made of lightweight metal alloy4. Often has a light on top which illuminates when box is "hot" <p>D. Lighting</p> <ol style="list-style-type: none">1. Mobile<ol style="list-style-type: none">a. Mounted on apparatusb. Frequently removablec. Usually on mast that can be turned or raisedd. Generally operated by plugging into outlet on apparatuse. Wattage varies 100-1000 or more2. Battery Operated<ol style="list-style-type: none">a. Common flashlightb. Headlamp mounted on helmetc. Powered by dry cell batteries <p>III. SAFETY CONSIDERATIONS</p> <p>A. Emergency Scene</p> <ol style="list-style-type: none">1. Avoid tunnel vision2. Consider<ol style="list-style-type: none">a. Topography	<p>What are junction boxes?</p>

4311.1



Fire Protection Training

Procedures Handbook 4300

COMPONENTS AND SAFETY CONSIDERATIONS FOR PORTABLE LIGHTING EQUIPMENT

PRESENTATION	APPLICATION
<ul style="list-style-type: none">b. WaterB. Safety Considerations for Portable Lighting System Components<ul style="list-style-type: none">1. Generator<ul style="list-style-type: none">a. Store fuel away from heat sourcesb. Keep fuel fresh - gasoline evaporates or decomposes over timec. Keep fuel storage area cleand. Petroleum products can damage other equipmente. Utilize correct fuel type/mixture (i.e. oil/gasoline, 2 cycle) per manufacturef. Avoid spilling fuel onto clothing and gloves during fillingg. Do not fill generator while it is runningh. Make sure generator is properly vented and groundedi. Insure exhaust is directed away from combustible materialsj. If portable - do not set generator on wet groundk. If portable - set generator on level basel. Insure that fly wheel is free of obstructions2. Domestic power<ul style="list-style-type: none">a. Do not use extension cords found on sceneb. Do not use domestic power unless receptacle is 3 pronged and groundedc. If unsure of system grounding, do not used. Utilize appropriate fire department pig-tail for incompatible connections	

4311.1



Fire Protection Training

Procedures Handbook 4300

COMPONENTS AND SAFETY
CONSIDERATIONS FOR PORTABLE
LIGHTING EQUIPMENT

PRESENTATION	APPLICATION
<ul style="list-style-type: none">3. Extension cords<ul style="list-style-type: none">a. Do not use if frayed, if bare wire is exposed, or if connections are looseb. Avoid stretching through areas of standing waterc. Utilize proper pig-tailsd. Lay cords out of traffic patterns as much as possiblee. Do not tie knots in cordsf. Use water proof connectorsg. Should be yellow in color to help eliminate tripping hazard4. Junction Boxes<ul style="list-style-type: none">a. Do not use if obviously damaged or connections are difficult to makeb. Do not overload. The system may not be able to use all available outletsc. Place junction out of the traffic patterns as much as possible5. Mobile electrical lights<ul style="list-style-type: none">a. Ensure light is securely anchored into holderb. Point light in appropriate direction prior to plugging inc. Do not "force" connectiond. Do not look into light when making connection6. Portable electrical lights<ul style="list-style-type: none">a. Do not set light in waterb. Keep light out of traffic patterns as much as possible	

4311.1



Fire Protection Training

Procedures Handbook 4300

COMPONENTS AND SAFETY
CONSIDERATIONS FOR PORTABLE
LIGHTING EQUIPMENT

PRESENTATION	APPLICATION
<ul style="list-style-type: none">c. The globe can cause painful burns even after short operational periodd. Avoid setting light where fire fighters become "blinded" by glowe. Don't look at light <p>7. Battery powered lights</p> <ul style="list-style-type: none">a. Ensure lights mounted to helmet are securely in placeb. Conceal electrical cords beneath top layer of clothing to reduce possibility of catching cord on protruding objects or obstacles	

4311.1



Fire Protection Training

Procedures Handbook 4300

COMPONENTS AND SAFETY
CONSIDERATIONS FOR PORTABLE
LIGHTING EQUIPMENT

SUMMARY:

Portable lighting is frequently used at emergency scenes to make emergency operations faster, easier, and safer. The components of a lighting system include a generator, extension cords, junction boxes and lights. When utilizing these systems the firefighter must remember that each component can cause injury if not used properly. One of the most important safety considerations is to ensure that all lighting systems are safe and properly grounded.

EVALUATION:

A written quiz.

ASSIGNMENT:

To be determined by instructor(s).